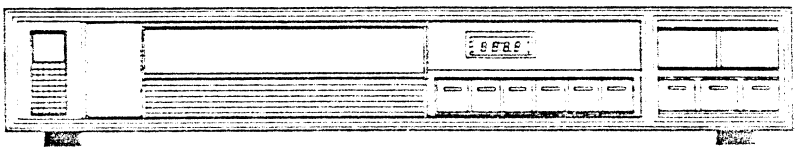
AS18

SERVICE MANUAL

UHER
CD20

Compact-disc Player



Specifications

AUDIO PERFORMANCE

Number of Channels	2
Frequency Response	20Hz~20kHz (+0/−1.5dB)
Dynamic Range	More than 80dB
Signal-to-Noise Ratio	90dB (1kHz)
Channel Separation	83dB (1kHz)
Distortion	0.01% (1kHz)
Wow and Flutter	Quartz crystal precision

SIGNAL FORMAT

Sampling Frequency	44.1kHz
Quantization	16 bits linear
Bit Rate	4.3212 million bit/sec.

DISC

Diameter	120mm (4¾")
	500~200 rpm (inside-outside)
Tracking Pitch	1.6μm
Playing Time	60 min.
Tracking System	Non-Contact Solid State Laser
	Laser Tracking at PCM
	Wavelength 0.78μm

GENERAL

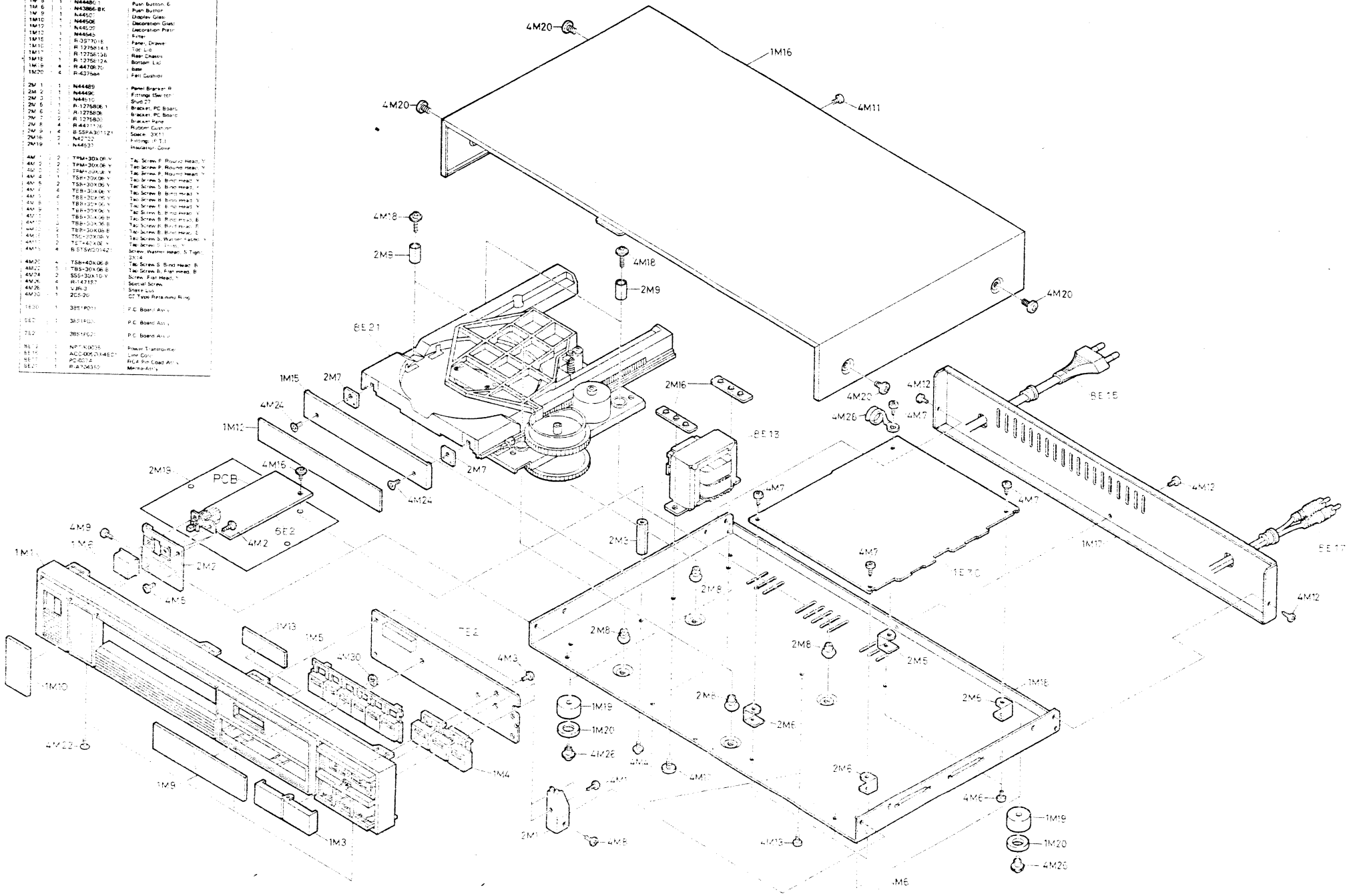
Power Requirements	220V AC ±10%
Power Consumption	15W
Dimensions (W×H×D)	421×75×281 mm
Weight (approx.)	3.8 kg

* Because its products are subject to continuous improvement, BENYTONE reserves the right to modify product designs and specifications without notice and without incurring any obligation.

Exploded view

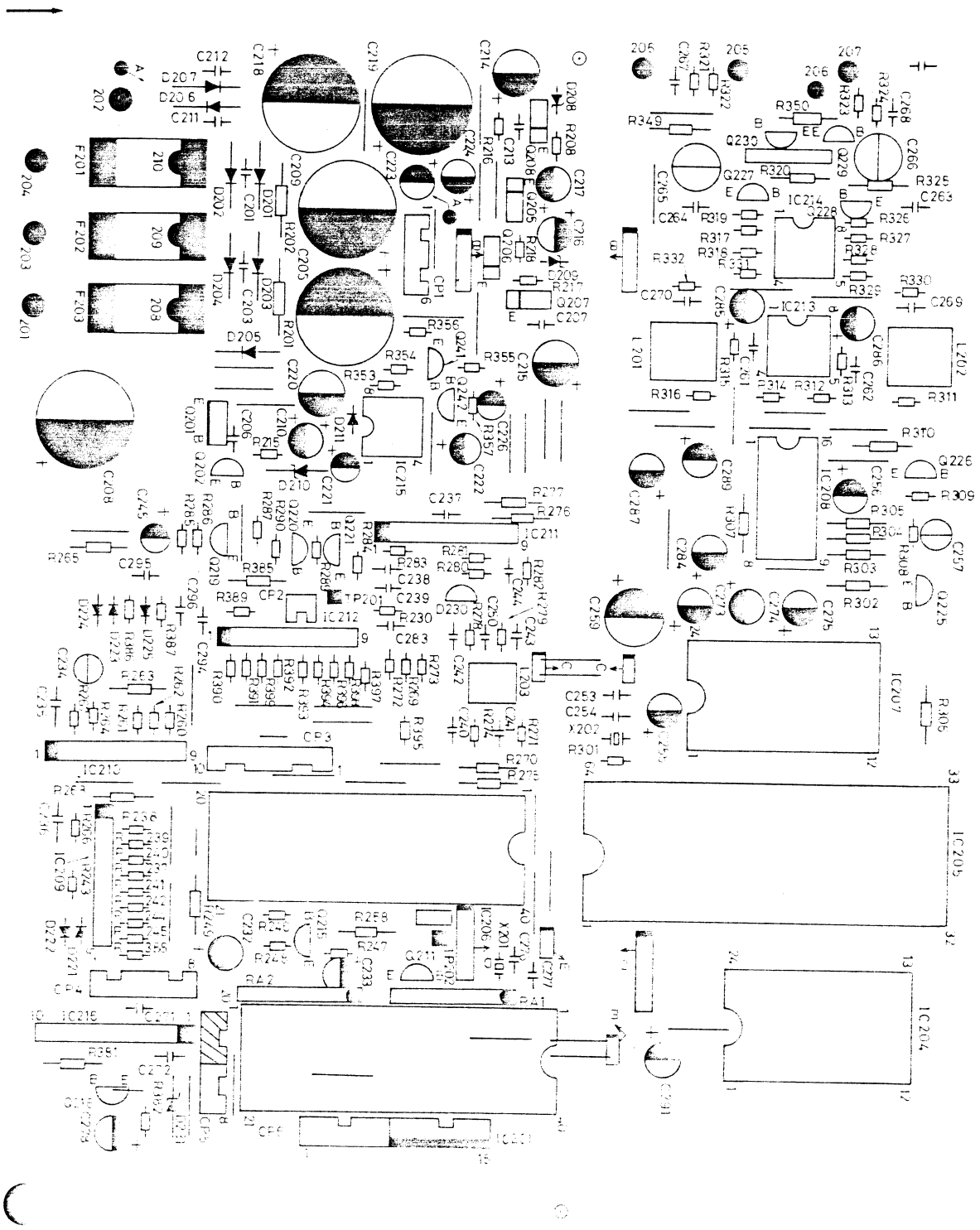
Exploded View's Parts List (CD20)

Ref. No.	Q'ty	Part No.	Description
1M 1	1	N1038[illegible]	Front Panel
1M 3	1	N44487	Push Button 1
1M 4	1	N44488	Push Button 2
1M 5	1	N44489	Push Button 3
1M 6	1	N44490	Push Button 4
1M 9	1	N43866-BK	Push Button
1M10	1	N44507	Display Glass
1M15	1	N44508	Decoration Glass
1M17	1	N44509	Decoration Plate
1M12	1	N44645	Rimp
1M13	1	R-3977018	Panel, Drawer
1M16	1	R-1275814-1	Top Lid
1M17	1	R-1275813-B	Rear Chassis
1M18	1	R-1275812-A	Bottom Lid
1M19	4	R-4470870	Base
1M20	4	R-4378[illegible]	Felt Cushion
2M 1	1	N44489	Panel Bracket R
2M 2	1	N44490	Fitting Switch
2M 3	1	N44610	Stud 27
2M 5	1	R-1275806-1	Bracket, PC Board
2M 6	2	R-1275808-	Bracket, PC Board
2M 7	2	R-1275830-	Bracket Plate
2M 8	4	R-4421170	Rubber Cushion
2M 9	4	B SSPA3011Z1	Space 3X11
2M16	2	N42722	Fitting (F.T.)
2M19	1	N44631	Insulation Cover
4M 1	2	TPM+30X08 Y	Tac Screw P. Round Head Y
4M 2	2	TPM+30X06 Y	Tac Screw P. Round Head Y
4M 3	3	TPM+30X16 Y	Tac Screw P. Round Head Y
4M 4	4	TSH+30X06 Y	Tac Screw S. Bind Head Y
4M 5	2	TSH+30X05 Y	Tac Screw S. Bind Head Y
4M 7	6	TBB+30X06 Y	Tac Screw B. Bind Head Y
4M 8	6	TBB+30X05 Y	Tac Screw B. Bind Head Y
4M 9	1	TBB+30X08 Y	Tac Screw B. Bind Head Y
4M 6	1	TBB+30X06 Y	Tac Screw B. Bind Head Y
4M [illegible]	1	TBB+30X16 B	Tac Screw B. Bind Head B
4M [illegible]	1	TBB+30X36 B	Tac Screw B. Bind Head B
4M [illegible]	2	TBB+30X06 B	Tac Screw B. Bind Head B
4M [illegible]	1	TSC+30X05 Y	Tac Screw S. Washer Head Y
4M [illegible]	2	TST+40X08 Y	Tac Screw T. Bind Head Y
4M15	4	B STSW3011Z1	Screw, Washer Head, S Tight 3X14
4M20	4	TSB+40X06 B	Tac Screw S. Bind Head B
4M22	1	TBS+30X06 B	Tac Screw B. Flat Head B
4M24	2	SSS+30X10 Y	Screw, Flat Head Y
4M26	4	R-1471187	Special Screw
4M28	1	UR-2	Shaft Cut
4M30	1	205-26	CT Type Retaining Ring
5E1	1	3851PD11	P.C. Board Ass'y
5E2	1	3851PD21	P.C. Board Ass'y
7E2	1	3851PD21	P.C. Board Ass'y
8E 2	1	NPT-1003S	Power Transformer
8E15	1	ACC-005-2X14-EC1	Line Cord
9E11	1	PC-031A	RCA Pin Load Ass'y
9E12	1	R-A7[illegible]360	Mechanism Ass'y



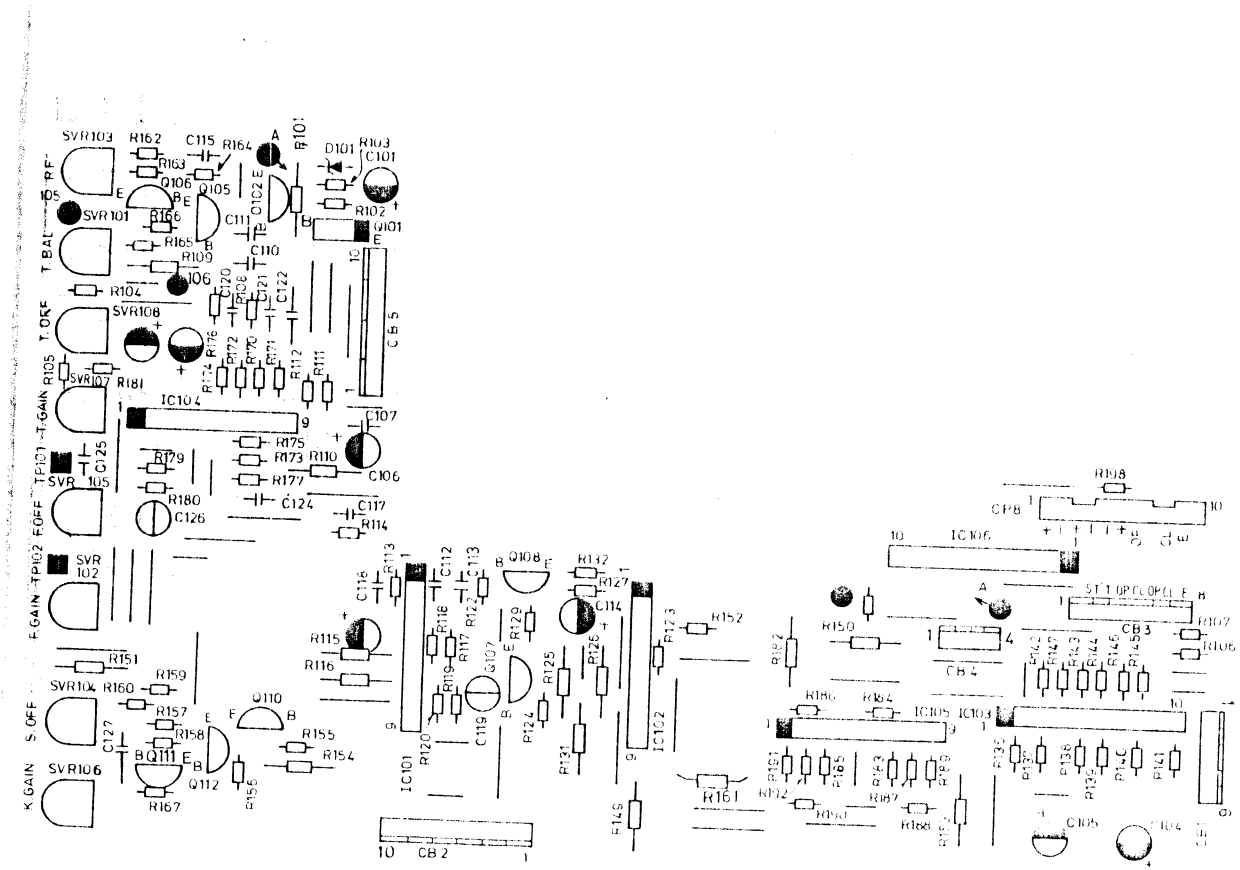
Main P.C.Board (R-4176829)

(Component side)



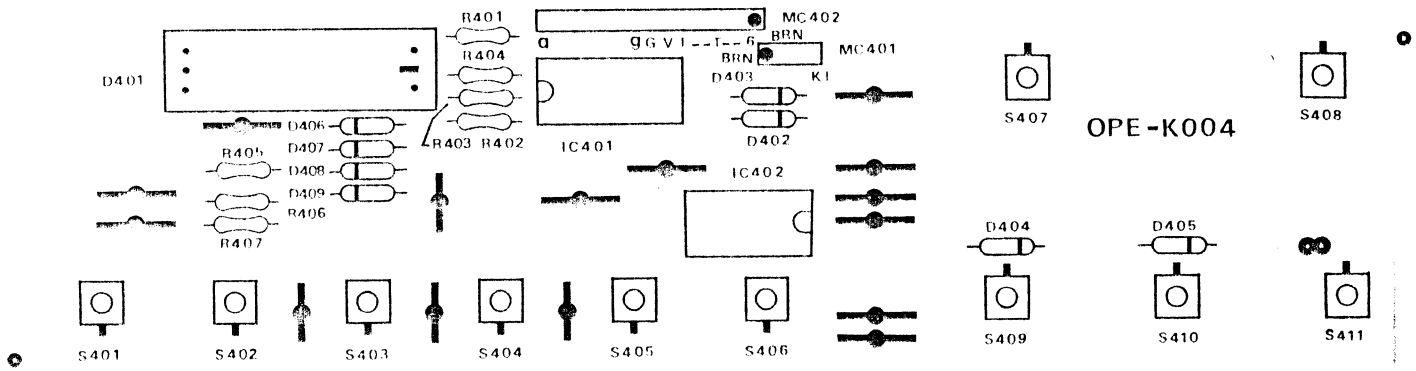
Servo P.C.Board (R-4176831)

(Component side)

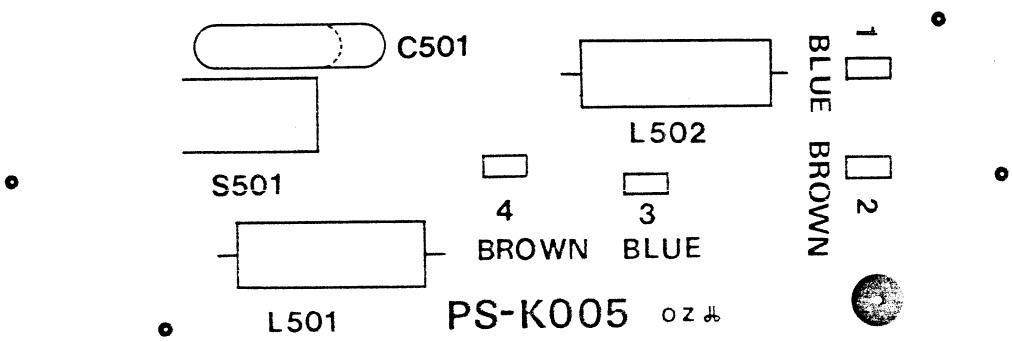


Function Switch P.C.Board (OPE-K004)

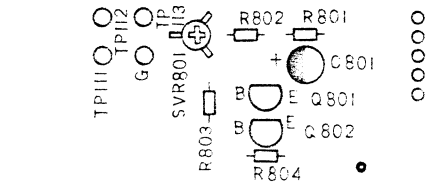
(Component side)



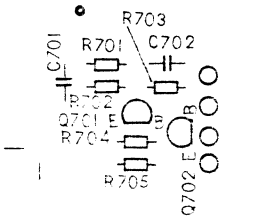
Power Switch P.C.Board (PS-K005)
(Component side)



Offset P.C.Board (R-417703)
(Component side)

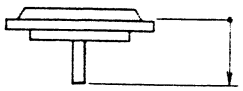
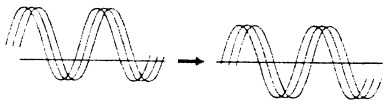
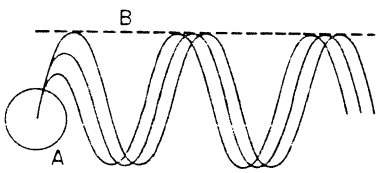


R.F.P.C.Board (R-4177067)
(Component side)

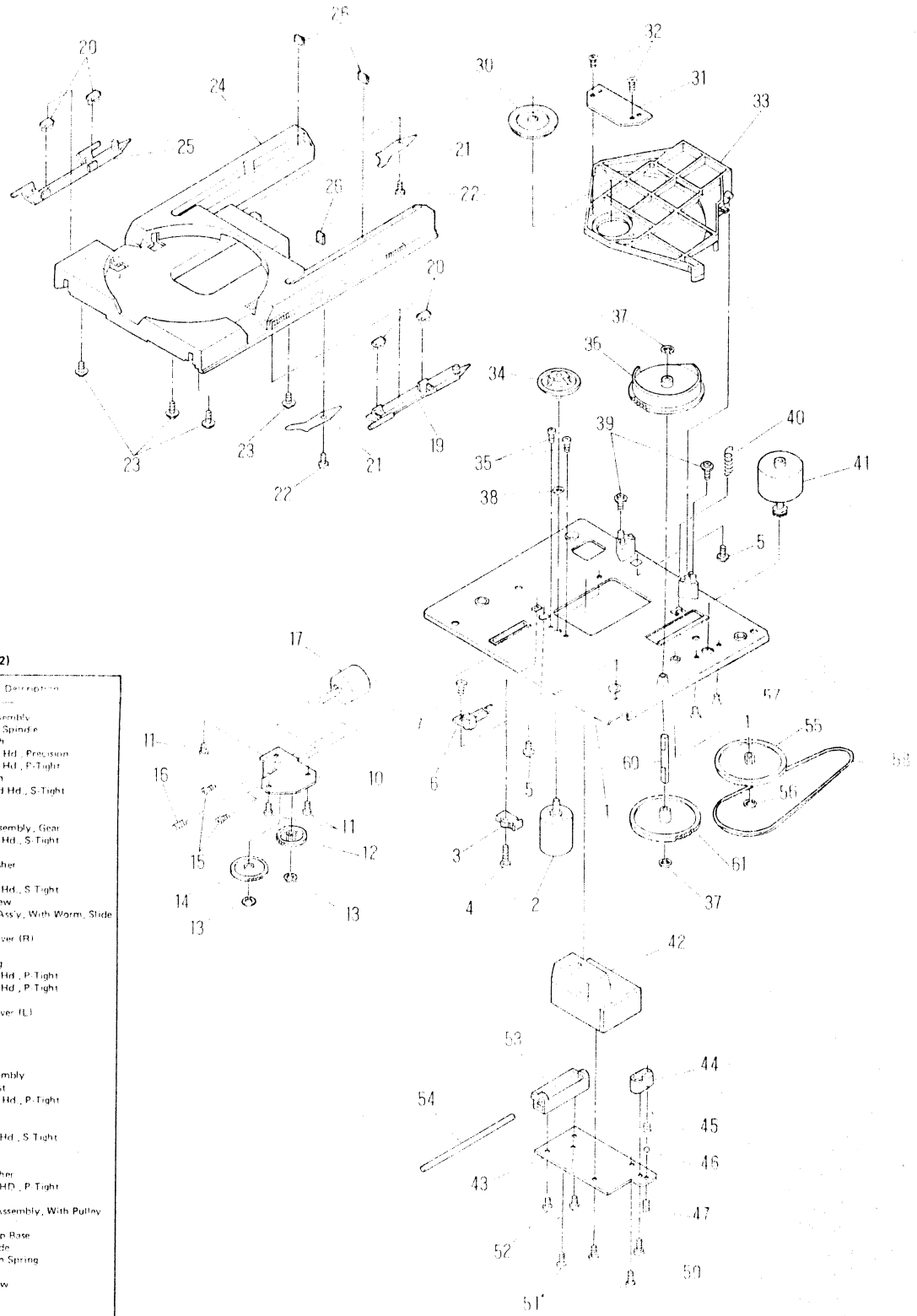


Alignment procedure

ADJUSTMENTS

STEP	Adjustment Item	Rating of Standard	Disc	Adjustment Method	Instrument required
1	Turntable height check	Confirm that the turntable height is within 11.5 ±0.05 m/m. 	NONSET	Turntable	Slide caliper
2	Check laser power.	Confirm that laser power is within the range of 0.234 to 0.286 mW.	NONSET	Turn power switch ON/OFF.	Laser power meter
3	Setting of semi-fixed registers	SVR103 SVR101 SVR108 SVR107 SVR105 SVR102 SVR104 SVR106			
4	Focus offset	Adjust so TP112 is at 0 V ± 10 mV.	NONSET	SVR105	Synchroscope or DC meter Special filter
5	Tracking balance	Turn SVR107 all the way counterclockwise. Adjust so that the waveform at TP111 is vertically symmetrical with respect to the 0 level as shown in the figure.  After adjustment, return SVR107 to its previous position.	SET (PLAY)	SVR101	Synchroscope
6	Tracking offset	Adjust so that the level at TP113 is 0 V ±10 mV.	NONSET	SVR108	Synchroscope, special filter
7	Jitter	Connect to terminal 105. With the tilt adjustment screw to the side of PICKUP, adjust so that part A of the eye pattern is clear and B is flat. 	SET (PLAY)	Jitter screw Note: After adjustment, lock the screw.	Synchroscope

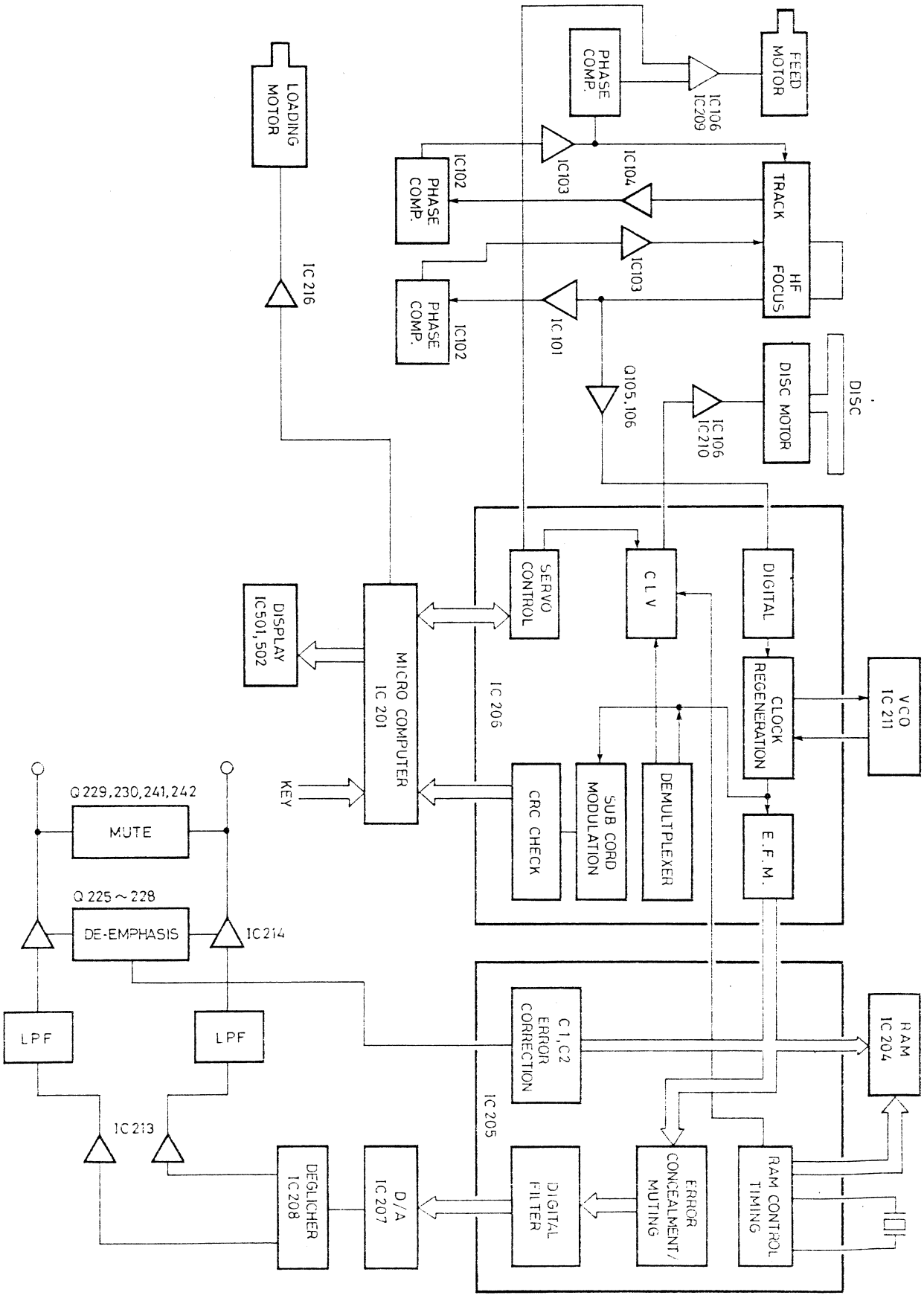
CD Mechanism Exploded view

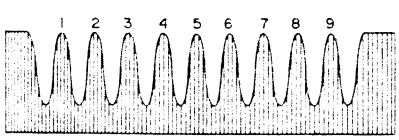


Exploded View's Parts List (R-A704352)

Ref No.	Q'ty	Part No.	Description
1	1	R-A702634	Chassis Assembly
2	1	R-S57336-1	DC Motor, Spindle
3	1	R-S470038	Leaf Switch
4	1	B-SSTN1708Z1	Screw, Pan Hd., Precision
5	2	S-STPN2606Z1FO	Screw, Pan Hd., P-Tight
6	1	R-S470252	Leaf Switch
7	1	B-STSB2605Z1	Screw, Bind Hd., S-Tight
8	0		
9	0		
10	1	R-A702635	Bracket Assembly, Gear
11	3	B-STSN2603Z1	Screw, Pan Hd., S-Tight
12	1	R-3976989	Gear, NA
13	2	R-3973913	Special Washer
14	1	R-3976990	Gear, NB
15	2	B-STSN172CZ1	Screw, Pan Hd., S Tight
16	1	R-2470350	Special Screw
17	1	R-A702636	DC Motor Ass'y, With Worm, Slide
18	0		
19	1	R-3976996	Bracket, Lever (R)
20	4	R-4471016	Cushion
21	2	R-1275792	Plate Spring
22	2	B-STPN2605Z1	Screw, Pan Hd., P-Tight
23	4	S-STPN2606Z1FO	Screw, Pan Hd., P-Tight
24	1	R-3976995	Guide, Disc
25	1	R-3976997	Bracket, Lever (L)
26	3	R-4471015	Cushion
27	0		
28	0		
29	0		
30	1	R-A702638	Flange Assembly
31	1	R-1276366	Plate, Thrust
32	2	B-STPS2606Z1	Screw, Flat Hd., P-Tight
33	1	R-3976999A	Plate, Disc
34	1	R-3976986	Turntable
35	2	B-STSN172CZ1	Screw, Pan Hd., S Tight
36	1	R-3976994	Cam
37	2	W-SNUR25	E-Ring, 2.5
39	1	R-377211	Special Washer
39	2	S-STPN2606Z1FO	Screw, Pan HD., P Tight
40	1	R-1572491A	Coil Spring
41	1	R-A702637	DC Motor Assembly, With Pulley
42	1	R-S07551-1	Pickup
43	1	R-1275790A	Plate, Pickup Base
44	1	R-3976998	Bracket, Slide
45	1	R-1572488	Compression Spring
46	1	R-147204	Steel Ball
47	1	R-2470350	Special Screw
48	0		
49	0		
50	1	B-STPB2005Z1	Screw, Bind Hd., P Tight
51	3	B-SBAI2603Z1	Screw, Bind Hd., 2.6 × 3
52	2	B-STPB2005Z1	Screw, Bind Hd., P Tight
53	1	R-3976987	Rack, Slide
54	1	R-1572489A	Shaft, Slide
55	1	R-3972645	Pulley
56	1	R-3973931	Special Washer
57	2	B-SBAI2603Z1	Screw, Bind Hd., 2.6 × 3
58	1	R-4471203	Belt
59	0		
60	1	R-2470351	Shaft, Gear C
61	1	R-3976993	Gear C

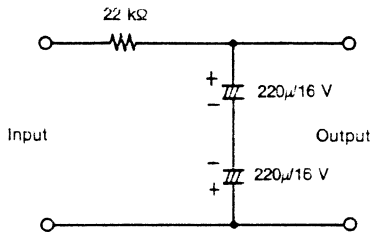
Block diagram



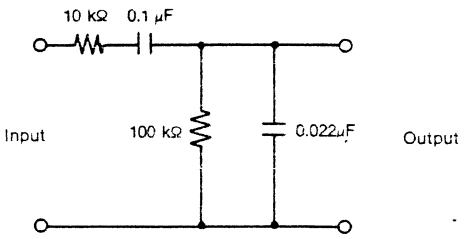
STEP	Adjustment Item	Rating of Standard	Disc	Adjustment Method	Instrument required
8	Diffraction grating	1) Turn SVR107 all the way counterclockwise. 2) Confirm that ther signal amplitude at TP111 is about 400 mV peak-to-peak and that the two whiskers point downward. If not, rotate the diffraction grating until the amplitude is a maximum, then adjust so that the whiskers point downward. Move PICK UP all the way inside and all the way outside, and confirm that the amplitude does not change. 3) Bond the diffraction grating. Note: Use caution to insure that drops do not splash on the periphery and no liquid gets inside.	SET (PLAY)	PICK UP	Synchroscope
9	Tracking balance	Turn SVR107 all the way counterclockwise (after adjustment is completed return to former position). Then, with only the focusing servo turned on, adjust until the waveform at TP111 is vertically symmetrical with respect to the 0 level as shown in the figure in STEP 5.	SET (PLAY)	SVR101	Synchroscope
10	Focus balance	As in the jitter adjustment, with the OFFSET P.C.B. semi-fixed settings adjust so that the terminal 105 eye pattern is clear and flat.	SET (PLAY)	SVR801	Synchroscope
11	Focus gain adjustment	Connect the audio signal to IC102 pin 3 through a resistance of 470 kilohms and input an 0.3 V 400 Hz signal. Adjust so that the 400 Hz output at pin 2 of IC101 is 16 dB lower than the input signal.	SET (PLAY)	SVR102	Special filter, CR oscillator, valve voltmeter
12	Tracking gain adjustment	Connect Audio SG to pin 7 of IC102 through a resistance of 470 kilohms and input an 0.3 V 400 Hz signal. Adjust so that the 400 Hz output at TP111 is 18 dB lower than the input signal.	SET (PLAY)	SVR107	Special filter, CR oscillator, valve voltmeter
13	Tracking offset adjustment	Connect a synchro or DC meter to TP113 and aadjust so that the laser lights up and the level becomes 0V.	NONSET	SVR108	Synchroscope, DC meter Special filter
14	RF level adjustment	Connect a synchro to terminal 105 and adjust so that the output becomes 2.0 V peak-to-peak.	SET (PLAY)	SVR103	Synchroscope
15	KICK gain	Trigger on the SVR106 kick pulse. Look at the RF waveform (CP2) on another channel and adjust so that the track jump becomes 11 ± 1 by manual search (forward, reverse). 	SET (PLAY)	SVR106	Synchroscope

STEP	Adjustment Item	Rating of Standard	Disc	Adjustment Method	Instrument required
16	VC0 adjustment	Disconnect CP2 and connect TP201 to ground. Connect TP202 to a frequency counter and adjust to 4.35 ± 0.005 MHz.	NONSET	L203	Frequency counter
17	Focus offset check and adjustment	Same as STEP 4			
18	Tracking offset check and adjustment	Same as STEP 6			

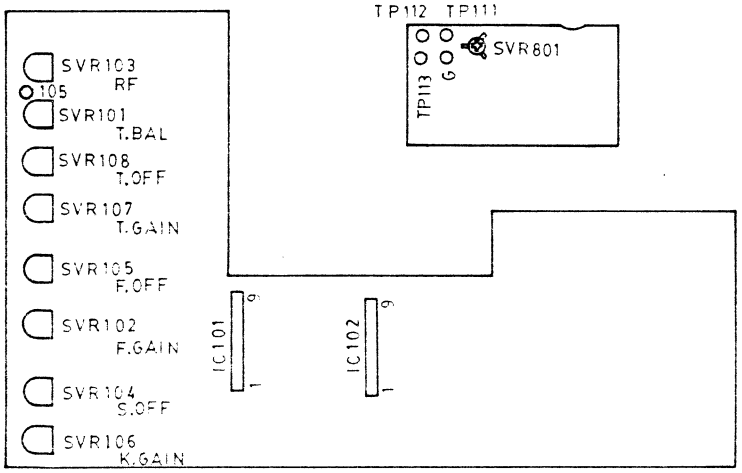
Filter for steps 4, 6, 13, 17, 18



Filter for steps 11, 12

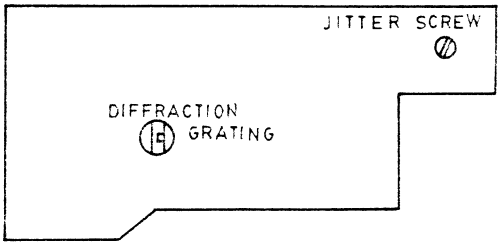


Servo P.C.Board

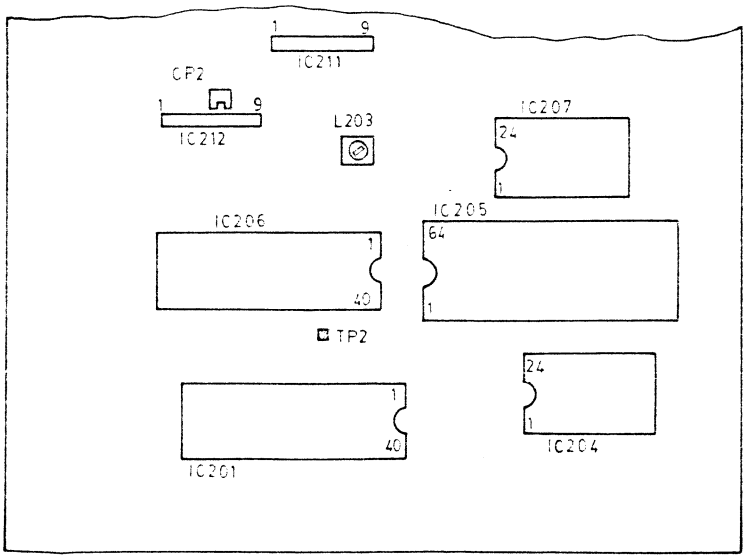


Offset P.C.Board

Pick Up Unit (Bottom View)



Main P.C.Board



Circuit diagram